TFW

Attorney Docket No. 1293.1740

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Kyung-geun LEE et al.

Serial No. 10/798,271 Group Art Unit: 2655

Confirmation No. 5858

Filed: March 12, 2004 Examiner:

For: INFORMATION STORAGE MEDIUM AND METHOD OF RECORDING AND/OR REPRODUCING DATA THEREON

RE-SUBMISSION OF VERIFIED TRANSLATION OF PROVISIONAL APPLICATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Further to a review of the Patent Application Information Retrieval (PAIR) system, it appears that the receipt of the verified translation of provision application no. 60/454,618 and the accompanying statement are not reflected in the instant application. A copy of the verified translation and the statement are enclosed in accordance with the provisions of 37 C.F.R. § 1.78. Moreover, also enclosed is a copy of the Utility Patent Application Transmittal taken from the PAIR system evidencing prior receipt of the same.

If there are any fees associated with filing of this Submission, please charge the same to our Deposit Account No. 503333.

Respectfully submitted,

STEIN, MCEWEN & BUI LLP

By: _____
James G. McEwen
Registration No. 41,983

1400 Eye Street, NW
Suite 300
Washington, D.C. 20005
Telephone: (202) 216-9505
Facsimile: (202) 216-9510

Date: Feb. 16, 2005

IN THE MATTER OF

U.S. Provisional Application No. **60/454,618**

By Samsung Electronics Co., Ltd

I, So-hee Kim, an employee of Y.P.LE, MOCK & PARTNERS of The Cheonghwa Bldg., 1571-18 Seocho-dong, Seocho-gu, Seoul, Republic of Korea, hereby declare that I am familiar with the Korean and English language and that I am the translator of U.S. Provisional Application and certify that the following is to the best of my knowledge and belief a true and correct translation.

Signed this 17th day of February 2004

Sohee Kim

SPECIFICATION

[Title of the Invention]

Information storage medium and method of recording and/or reproducing data on the same

[Brief Description of the Drawings]

FIG. 1 shows the structure of a data area in a recordable information storage medium;

FIG. 2 shows the data structure of a disk control data zone in a lead-in area included in an information storage medium according to the present invention;

FIG. 3 is a diagram for explaining a method of recording and/or reproducing data on an information storage medium according to the present invention;

FIG. 4 shows the structure of a data area in a reproduction-only information storage medium; and

FIG. 5 is a block diagram of a drive device for recording and/or reproducing data on an information storage medium according to the present invention.

< Explanation of Reference numerals designating Major Elements in the Drawings>

10, 40 ... lead-in area	20, 45 ... user data area
30, 50 ... lead-out area	10-2 ... disk control data zone

[Detailed Description of the Invention]

[Object of the Invention]

[Technical field of the Invention and Prior Art belonging to the Field]

The present invention relates to an information storage medium and a method of recording and/or reproducing data thereon, and more particularly, to an information storage medium in which if additional information is generated while a standard with a certain version number is keeping the version number, a revision number associated with the additional information is recorded, and a method of recording and/or reproducing data therein.

General information storage media are widely used as information recording media of optical pickup apparatuses for recording/reproducing information in a non-contact way. Optical disks, which are information storage media, are classified

as compact disks (CDs) or digital versatile disks (DVDs) according to their information storage capacity. Examples of recordable optical disks are 650MB CD-R, CD-RW, and 4.7GB DVD+RW. Furthermore, HD-DVDs having a recording capacity of 20GB or greater are under development.

Standards for the physical structures of various types of storage media or for various methods of recording and/or reproducing data thereon are being established. The standards for storage media deal with a great number of elements, particularly, a recording capacity or a recording speed. For example, if many recording/reproduction conditions are required to increase the recording capacity and they are different from the conditions prescribed in an existing standard, standard version numbers vary with the upgrading standards.

When a standard version number is updated, recording/reproduction conditions are prescribed according to a new standard. Contents related to recording/reproduction keep changing, and additional information about the changed contents needs to be provided. In general, when a new standard is determined, the version number is changed. However, only some of the contents related to recording/reproduction may be changed without any change in the version number. In the prior art, such additional information is not recorded in storage media, and instead, it is provided through an extra additional information brochure.

In storage media having a standard version 2.0, 1× to 4× recording speeds are generally prescribed. However, such storage media can record data at up to 5× recording speed. Here, because all of the existing recording speeds are satisfied, the version number is not changed, and information about a 5× recording speed must be additionally provided. In the case of the storage media with a standard version 2.0, information representing that they can record data at 5× speed is recorded in an extra additional information brochure.

Accordingly, when addition information is generated, a drive system cannot recognize the additional information, thus causing great inconvenience to users.

[Technical goal of the Invention]

The present invention provides an information storage medium in which a revision number about additional information associated with standards having an identical version number is recorded as reproduction-only data, and data can be adaptively recorded and/or reproduced depending on the revision number.

[Structure of the Invention]

According to an aspect of the present invention, there is provided an information storage medium in which data is recorded and/or reproduced, wherein a standard version number and a revision number distinguished from the standard version number are recorded in a reproduction-only area.

The information storage medium includes a lead-in area, a user data area, and a lead-out area, and the reproduction-only area is included in at least one of the lead-in and lead-out areas.

The reproduction-only area is a disk control data zone, and the revision number is recorded in an m-th byte of the disk control data zone.

When the revision number is x.y, x is recorded in four most significant bits of the m-th byte, and y is recorded in four least significant bits of the m-th byte.

According to another aspect of the present invention, there is provided a method of recording and/or reproducing data in an information storage medium which includes a lead-in area, a user data area, and a lead-out area, the method including the steps of: recording a standard version number in the reproduction-only area of at least one of the lead-in and lead-out areas, recording a revision number distinguished from the standard version number in the reproduction-only area, and reading the standard version number and the revision number and recording and/or reproducing data according to a standard associated with the standard version number and the revision number. The last step is performed by a drive.

An information storage medium according to the present invention and a method of recording and/or reproducing data thereon will now be described in detail with reference to the accompanying drawings, in which embodiments of the invention are shown.

FIG. 1 shows the structure of a data area in a recordable information storage medium, which includes a lead-in area 10, a user data area 20, and a lead-out area 30. A standard version number and a revision number can be recorded in a reproduction-only area of at least one of the lead-in and lead-out areas 10 and 30.

If a recording/reproduction characteristic of a storage medium has been changed and its standard version number has been changed, a number associated with information about the changed characteristic is provided and referred to as a

revision number. The revision number can be provided when additional information is generated.

In other words, when the content of at least one of the items associated with data recording and/or reproduction, which are set according to a standard corresponding to the standard version number, has been changed, a revision number corresponding to the changed item is recorded.

The lead-in area 10 can be divided into a reproduction-only area and a recordable area. The lead-in area 10 may include a first buffer zone 10-1, a disk control data zone 10-2, a disk test zone 10-3, a drive device test zone 10-4, a defect management zone 10-5, a reserve zone 10-6, and a second buffer zone 10-7. For example, the first buffer zone 10-1 and the disk control data zone 10-2 belong to the reproduction-only area, where data is recorded during the manufacture of a storage medium. The other zones belong to the recordable area.

Preferably, a version number and a revision number are recorded in the disk control data zone 10-2. As shown in FIG. 2, the disk control data zone 10-2 is comprised of a plurality of bytes. The revision number can be recorded in an m-th byte of the disk control data zone 10-2. FIG. 2 shows an example in which a revision number is recorded in a third byte of the disk control data zone 10-2. Alternatively, the revision number may be recorded in a reserve zone, which is a tenth zone.

As shown in FIG. 3, one byte is comprised of 8 bits, which are zeroth through seventh bits 0b through 7b. If the revision number is x.y, and it is recorded in one byte, x is recorded in the four bits in front, that is, seventh through fourth bits 7b through 4b, while y is recorded in the four bits at rear, that is, the third through zeroth bits 3b through 0b. If the revision number is 0.1, it can be recorded as 00000001b. If the revision number is 1.1, it can be recorded as 00010001b. When the revision number is recorded in this manner, a hexadecimal or binary system can be used.

An example of a storage medium in which a standard version is unchanged and a revision number is provided to the storage medium will now be described. For example, the standard version 2.1 prescribes 1× to 4× recording speeds. However, if up to 5× recording speed can be made, the fact that data can also be recorded at a 5× recording speed without change in the version number 2.1 needs to be represented. In this case, the version number, for example, 2.1, can be recorded in a zeroth byte, while a revision number, for example, 1.0, can be

recorded in an m-th byte. A drive device, which records/reproduces data on/from a storage medium, reads out the revision number and accordingly can record/reproduce data at a 5× recording sped.

If data can be recorded not only at 1× to 4× recording speeds but also at 5×and 6× recording speeds, the version number is maintained as 2.1, and a revision number is recorded, representing additional information about the 6× recording speed. For example, 2.0 can be recorded as the new revision number. The drive device reads out the new revision number and accordingly can record and/or reproduce data at the 6× recording speed. If the revision number is 1.0, data can be recorded at up to 5× recording speed. If the revision number is 2.0, up to 6× recording speed can be made to record data.

In the above, the provision of a revision number when a recording speed is changed has been described. However, even when an element other than the recording speed is changed, for example, even when a mass eccentricity or a recording capacity is changed, a revision number can be provided.

As described above, the revision number can be updated every time new additional information is generated. The updated revision number is recorded in a predetermined single byte. The revision number is recorded as reproduction-only data upon the manufacture of a storage medium. For example, the revision number can be recorded in the form of pits or a groove wobble.

Also, the revision number can be recorded in both the reproduction-only area of the lead-in area 10 and that of the lead-out area 30. Alternatively, the revision number can be recorded in each of at least two bytes of the reproduction-only area of the lead-in or lead-out area 10 or 30. For example, a revision number can be recorded in each of m-th and (m+1)th bytes of the disk control data zone 10-2. By doing this, when any of the repetitively recorded revision numbers is damaged, the other revision numbers can be used, thereby increasing the reliability of the revision number.

FIG. 4 shows the structure of a data area in a reproduction-only information storage medium, which includes a lead-in area 40, a user data area 45, and a lead-out area 50. All of these areas are comprised of a reproduction-only area. Preferably, a revision number is recorded particularly in a disk-related data zone 40-1 included in the lead-in area 40. The revision number can be repetitively recorded in both the lead-in and lead-out areas 40 and 50. Alternatively, the

revision number can be recorded at least twice in the lead-in or lead-out area 40 or 50.

A method of recording and/or reproducing data in an information storage medium according to the present invention will now be described with reference to FIG. 1. First, a standard version number is recorded in the reproduction-only area of at least one of the lead-in and lead-out areas 10 and 30, and a revision number distinguished from the standard version number is also recorded therein. Additional information corresponding to the revision number is separately prescribed in a predetermined area.

For example, the revision number is recorded in a predetermined byte of the disk control data zone 10-2 included in the lead-in area 10. If the information storage medium having the revision number is inserted into a drive device, the drive device reads out the standard version number and the revision number and records and/or reproduces data in and/from the information storage medium according to a standard corresponding to the standard version number and the revision number.

A drive system for recording and/or reproducing data on an information storage medium according to the present invention is shown in FIG. 5. Upon data recording, an audio/video (AV) encoder 110 compresses an AV signal according to a predetermined compression scheme and provides information about the size of compression data. A digital signal processor 120 receives compressed AV data from the AV encoder 110, adds data for ECC processing to the compressed AV data, and modulates the resulting data according to a predetermined modulation scheme. A radio frequency (RF) amplifier 130 converts data modulated by the digital signal processor 120 into an RF signal. A pickup 140 records the RF signal received from the RF amplifier 130 on a disk mounted on a turntable of the pickup 140. A servo 150 receives data necessary for servo control from a system controller 160 and performs a servo function for the disk.

Upon reproduction of data recorded in the disk, the pickup detects an optical signal from the disk and extracts the recorded data from the optical signal. The RF amplifier 130 converts the optical signal into an RF signal and extracts and modulates a servo signal to perform a servo function. The digital signal processor 120 demodulates the modulated data, which is received from the RF amplifier 130, according to a modulation scheme used upon the data modulation, corrects an error through an ECC process, and removes the additional data from the recorded data.

The servo 150 receives data necessary for servo control from the system controller 160. The AV encoder 110 decodes the compressed AV data received from the digital signal processor 120 and outputs an AV signal. The system controller 160 controls the entire drive system to record or reproduce data on the disk mounted on the turntable of the pickup.

When a storage medium has been inserted into such a drive device, the drive device reads out the version number and the revision number and records and/or reproduces data according to a standard corresponding to the version number and the revision number.

In the data recording and/or reproducing method according to the present invention, if the content of an item in an identical standard version is changed, a revision number corresponding to the changed content is recorded. If the mass eccentricity of a storage medium is changed, a revision number associated with the changed mass eccentricity, for example, number 2.0, is recorded in a predetermined byte of the disk control data zone 10-2.

Although the case where the mass eccentricity has been changed was described in the above, the same rule is applied to the case where a recording speed is changed, so this case will not be described in detail.

In the data recording and/or reproducing method according to the present invention, as storage media are quickly upgraded, there is a large possibility that contents determined in standards are modified. Extra data is provided so that the drive can recognize the modified contents.

[Effect of the Invention]

As described above, in a method of recording and/or reproducing data in an information storage medium according to the present invention, a revision number distinguished from a standard version number is recorded. If an item is changed while the standard for an information storage medium keeps uniform, a revision number corresponding to the changed content is provided. A drive device, which records and/or reproduces data in a storage medium, recognizes changed information using the revision number and can adaptively record or reproduce data depending on the changed information.

What is claimed is:

1. An information storage medium in which data is recorded and/or reproduced, wherein a standard version number and a revision number distinguished from the standard version number are recorded in a reproduction-only area.

2. The information storage medium of claim 1, wherein a lead-in area, a user data area, and a lead-out area are included, and the reproduction-only area is included in at least one of the lead-in and lead-out areas.

3. The information storage medium of claim 2, wherein the reproduction-only area is a disk control data zone which is included in at least one of the lead-in and lead-out areas.

4. The information storage medium of claim 3, wherein the revision number is recorded in an m-th byte of the disk control data zone.

5. The information storage medium of claim 4, wherein every time the revision number is changed, the changed revision number is recorded in the m-th byte.

6. The information storage medium of any of claims 2 through 5, wherein the revision number is repeatedly recorded in both the lead-in and lead-out areas.

7. The information storage medium of claim 4 or 5, wherein when the revision number is x.y, x is recorded in four most significant bits of the m-th byte, and y is recorded in four least significant bits of the m-th byte.

8. The information storage medium of any of claims 1 through 3, wherein the revision number is repeatedly recorded in at least two of the bytes existing in the reproduction-only area.

9. A method of recording and/or reproducing data in an information storage medium which includes a lead-in area, a user data area, and a lead-out area, the method comprising:

recording a standard version number in the reproduction-only area of at least one of the lead-in and lead-out areas;

recording a revision number distinguished from the standard version number in the reproduction-only area; and

a drive reading the standard version number and the revision number and recording and/or reproducing data according to a standard associated with the standard version number and the revision number.

10. The method of claim 9, wherein the reproduction-only area is a disk control data zone included in at least one of the lead-in and lead-out areas.

11. The method of claim 9 or 10, wherein the revision number is recorded in an m-th byte of the disk control data zone.

12. The method of claim 11, wherein every time the revision number is changed, the changed revision number is recorded in the m-th byte.

13. The method of claim 9 or 10, wherein the revision number is repeatedly recorded in both the lead-in and lead-out areas.

14. The method of claim 11, wherein when the revision number is x.y, x is recorded in four most significant bits of the m-th byte, and y is recorded in four least significant bits of the m-th byte.

15. The method of claim 9 or 10, wherein the revision number is repeatedly recorded in at least two of the bytes existing in the reproduction-only area.

FIG. 1

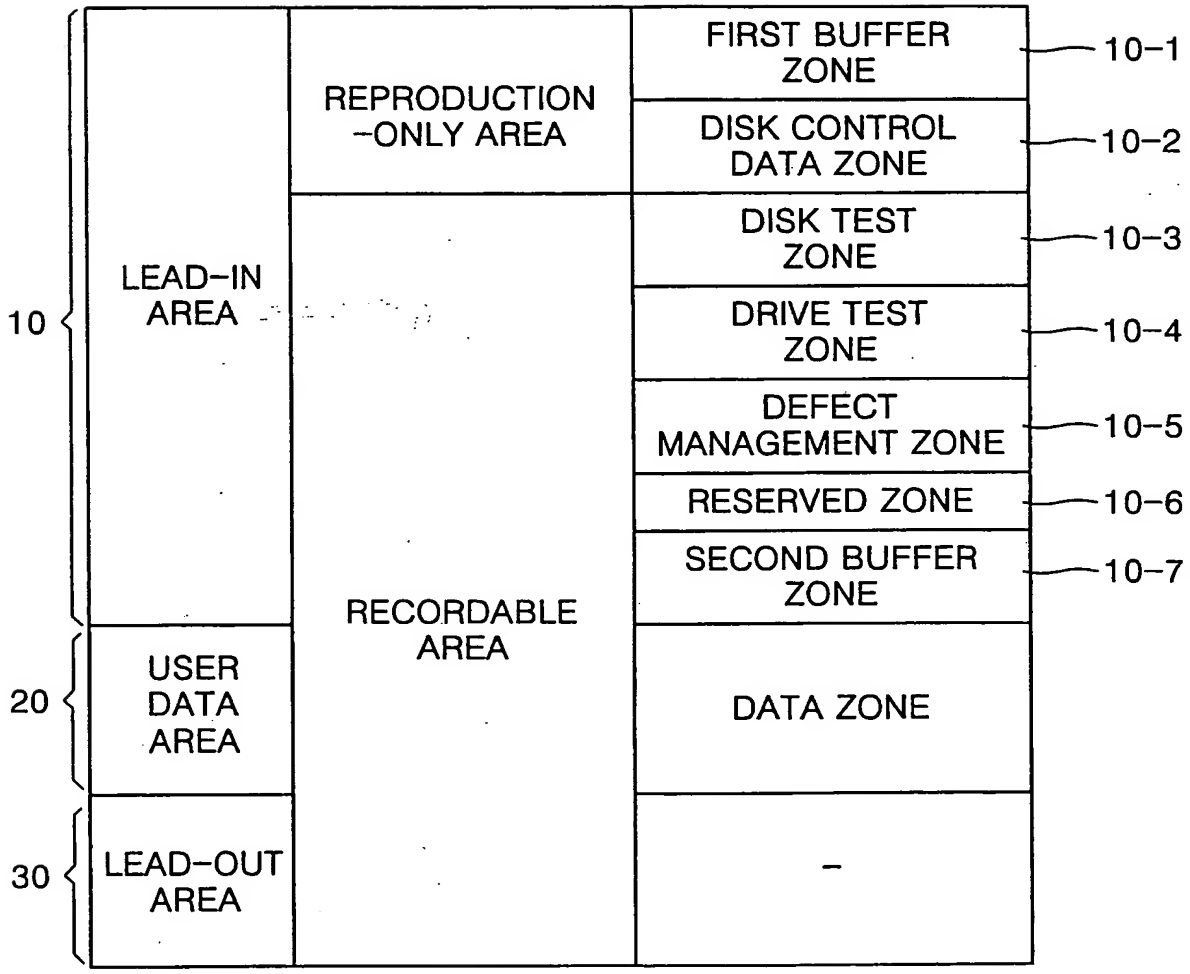

10
20
30
LEAD-IN AREA
USER DATA AREA
LEAD-OUT AREA
REPRODUCTION -ONLY AREA
RECORDABLE AREA
FIRST BUFFER ZONE
DISK CONTROL DATA ZONE
DISK TEST ZONE
DRIVE TEST ZONE
DEFECT MANAGEMENT ZONE
RESERVED ZONE
SECOND BUFFER ZONE
DATA ZONE
-
10-1
10-2
10-3
10-4
10-5
10-6
10-7

FIG. 2

BYTE NUMBER	CONTENTS	NUMBER OF BYTES
0	TYPE AND VERSION NUMBER OF DISK (DVD, Ver1.0)	1
1	DISK SIZE (120mm)	1
2	DISK STRUETURE (SINGLE LAYER)	1
3	REVISION NUMBER	1
4	. . . .	
5	RECORDING SPEED	1
6	REPRODUCTION POWER	1
7	. . . .	1
8	. . . .	1
9	. . . .	1
10	RESERVED	1
. . . .	. . . .	. . . .

FIG. 3

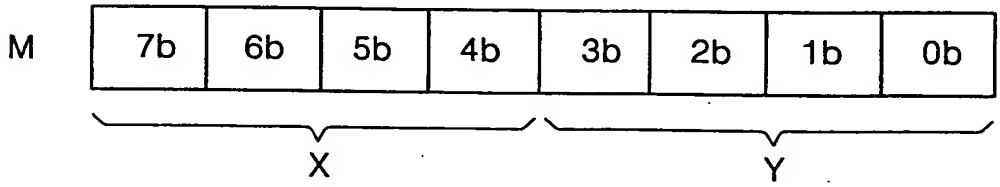


FIG. 4

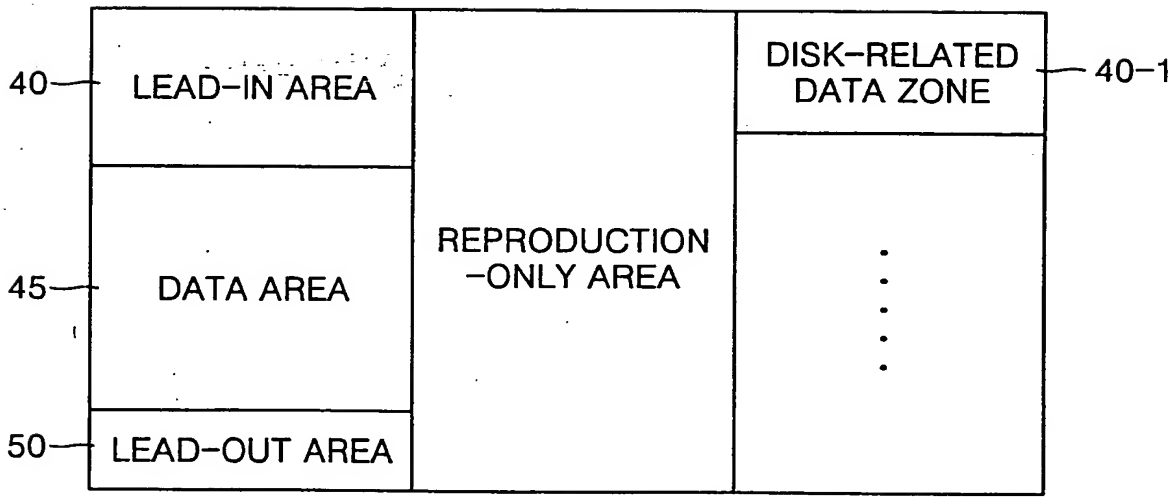
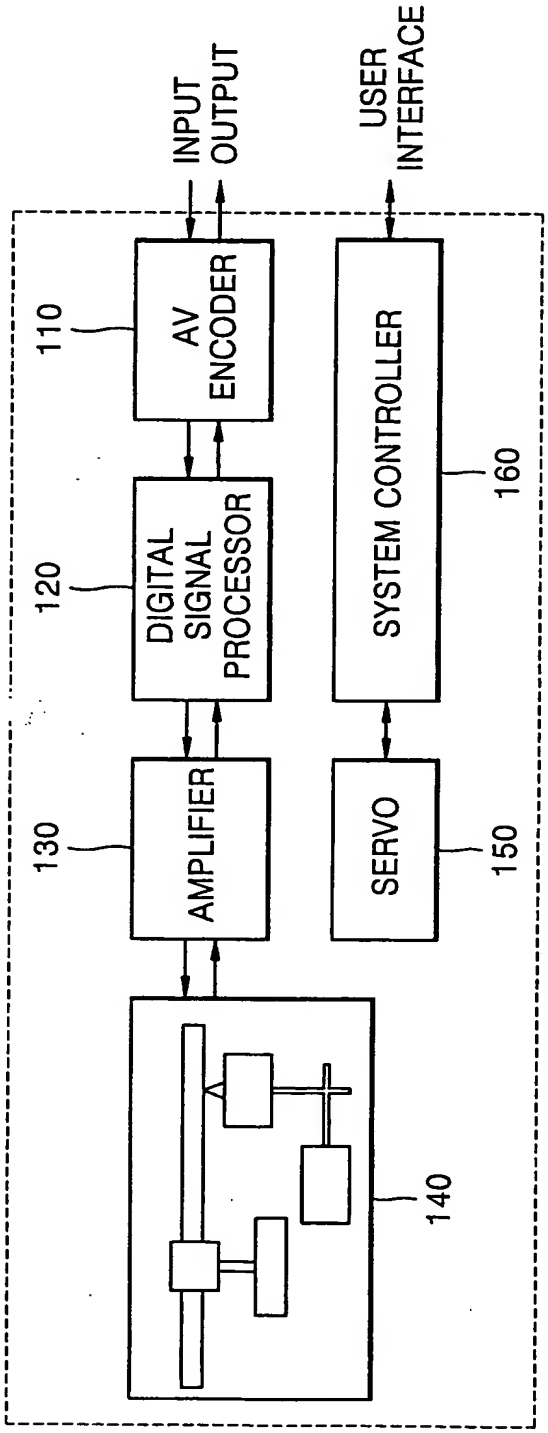

40
LEAD-IN AREA
45
DATA AREA
50
LEAD-OUT AREA
REPRODUCTION
-ONLY AREA
DISK-RELATED
DATA ZONE
40-1

FIG. 5


INPUT
OUTPUT
USER
INTERFACE
110
AV
ENCODER
120
DIGITAL
SIGNAL
PROCESSOR
130
AMPLIFIER
140
SYSTEM CONTROLLER
160
SERVO
150

S&H Form: PTO/SB/05 (2/02)

UTILITY PATENT APPLICATION

TRANSMITTAL

(Only for original applications)

	Attorney Docket No. 1293.1740
	First Named Inventor or Application Identifier: Kyung-geun LEE et al.
	Express Mail Label No.
APPLICATION ELEMENTS *See MPEP chapter 600 concerning utility patent application contents.*	*ADDRESS TO:* **Mail Stop Patent Application Commissioner for Patents PO Box 1450 Alexandria, VA 22313-1450**

1. ☒ Fee Transmittal Form
2. ☒ Specification, Claims & Abstract .....[Total Pages: 15]
3. ☒ Drawing(s) *(35 USC 113)* .....[Total Sheets: 4] [FIGS. 1, 2-3, 4, and 5]
4. ☒ Oath or Declaration .....[Total Pages: 1]
   a. ☒ Newly executed (original or copy)
   b. ☐ Copy from a prior application (37 CFR 1.63(d))
      i. ☐ DELETION OF INVENTOR(S)
      Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
5. ☐ Verified Statement Claiming Small Entity Status
6. ☐ Application Data Sheet. See 37 C.F.R. 1.76
7. ☒ Applicant claims priority benefit to: Korean Application 2003-16496 filed March 17, 2003; U.S. Provisional Application No. 60/454,618 filed March 17, 2003
8. ☐ CD-Rom or CD-R in duplicate, large table or Computer Program (Appendix)
9. ☐ Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all necessary)*
   a. ☐ Computer Readable Form (CRF)
   b. ☐ Specification Sequence Listing on:
      i. ☐ CD-ROM or CD-R (2 copies); or
      II. ☐ paper
   c. ☐ Statement verifying identity of above copies
10. ☐ For publication of assignee information under 37 CFR 1.215(b), list the assignee as Samsung Electronics Co., Ltd. of Suwon-si, Republic of Korea. The Assignment papers will be filed later.

ACCOMPANYING APPLICATION PARTS

11. ☒ Assignment (cover sheet & document(s)) to Samsung Electronics Co., Ltd. of Suwon-si, Republic of Korea
    ☒ for publication of assignee information under 37 CFR 1.215(b)
12. ☐ 37 CFR 3.73(b) Statement *(when there is an assignee)* ☐ Power of Attorney
13. ☐ English Translation Document *(if applicable)*
14. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
15. ☐ Preliminary Amendment
16. ☒ Return Receipt Postcard (MPEP 503) *(Should be specifically itemized)*
17. ☒ Certified Copy of Priority Document(s) *(if foreign priority is claimed)*
18. ☐ Request and Certification for Nonpublication under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or its equivalent
19. ☒ Other: Certified Translation of U.S. Provisional Application No. 60/454,618 filed March 17, 2003

20. CORRESPONDENCE ADDRESS

21171

PATENT TRADEMARK OFFICE